**Amendments to the Claims**

This listing of claims will replace all prior versions and/or listing of claims in the application.

1. (Currently Amended) A method for initializing[,] and adapting a communications receiver [and increasing] for increased data throughput, comprising the steps of:

receiving frames of data;

estimating values of taps of a frequency domain equalizer (FEQ) with an averaging technique that removes noise and improves performance;

minimizing lengths of the taps using the data;

calculating values of the taps with the estimated values [and] through an N Log N matrix inversion solution using the data; and

generating an average of the frames of data.

2. (Original) The method of Claim 1, wherein estimating values of the taps with an averaging technique further comprises estimating values of taps by using an equation comprising:

$$y_i = \frac{1}{N_p} \sum_{j=1}^{N_p} y_i^{\,j}$$

where y is demodulated output, and N is a symbol size expressed in samples.

3. (Currently Amended) The method of Claim 1, wherein minimizing lengths of taps further comprises multiplying each row of [the] an N [Log] by N matrix with the pilot signal.

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4. (Currently Amended) The method of Claim 1, wherein calculating values of the taps with an N Log N matrix <u>inversion solution</u> and the data further comprises calculating values of the taps with a Toeplitz matrix having a structure of:

$$Y = \begin{bmatrix} y_{k \bullet s+v+1} & y_{k \bullet s+v} & \cdot & y_{k \bullet s+v-T+2} \\ y_{k \bullet s+v+2} & y_{k \bullet s+v+1} & \cdot & y_{k \bullet s+v-T+3} \\ \cdot & \cdot & \cdot & \cdot \\ y_{(k+1) \bullet s} & y_{(k+1) \bullet s-1} & \cdot & y_{k \bullet s+v-T+1} \end{bmatrix}$$

where Y is a (N x T) Toeplitz matrix of received signal samples, y is demodulated output, s = N+v and is a length of a symbol including prefix, N is a symbol size expressed in samples, k is a time index, and v is a length of a cyclic prefix.

5. (Currently Amended) The method of Claim 1, wherein generating an average of the frames of data comprises:

$$F_i = \frac{1}{M_p} \sum_{j=1}^{M_p} F_i^{\,j}$$

where M is M is the number of tones according to the sub-channels, and $F_N$ is an N [by] <u>Log</u> N <u>inversion solution</u> FFT-matrix.

6. (Original) The method of Claim 1, further comprising storing a frame of data in the receiver comprising one or more symbols.

7. (Original) The method of Claim 1, further comprising applying a synchronization delay to the signal.

8. (Original) The method of Claim 1, further comprising aligning received frames of data based on the stored frame.

9. (Original) The method of Claim 1, further comprising resetting a frame counter.

10. (Original) The method of Claim 1, further comprising:
converting the training signal into parallel signals; and
removing a cyclic prefix from the parallel signals.

11. (Original) The method of Claim 1, further comprising transforming received parallel signals using a sliding discrete Fourier transform.

12. (Original) A communications receiver having computer-executable instructions for performing the steps recited in Claim 1.

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13. (Currently Amended) A communications receiver comprising:

a T-tap time domain equalizer (TEQ) for shortening lengths of a channel input response of a received signal;

a frequency domain equalizer (FEQ) comprising $N$ 1-tap filters for correcting a phase rotation and an amplitude attenuation of the received signal;

a processing unit;

a memory storage device; and

a program stored in the memory storage device for providing instructions to the processing unit; the processing unit responsive to the instructions of the program, operable for

estimating values of taps of a frequency domain equalizer (FEQ) with an averaging technique that removes noise;

minimizing lengths of the tap filters for the frequency domain equalizer (FEQ); and

calculating values of the taps with the estimated values and an N Log N matrix inversion solution.

14. (Original) The receiver of Claim 13, wherein the processing unit is further operable for generating an average of received frames of data.

15. (Original) The receiver of Claim 13, wherein estimating values of the taps with an averaging technique further comprises estimating values of taps by using an equation comprising:

$$y_i = \frac{1}{N_p} \sum_{j=1}^{N_p} y_i^{\,j}$$

where y is demodulated output, and N is a symbol size expressed in samples.

16. (Currently Amended) The receiver of Claim 13, wherein calculating values of the taps with an N Log N matrix <u>inversion solution</u> and the data further comprises calculating values of the taps with a Toeplitz matrix having a structure of:

$$Y = \begin{bmatrix} y_{k\bullet s+v+1} & y_{k\bullet s+v} & \cdot & y_{k\bullet s+v-T+2} \\ y_{k\bullet s+v+2} & y_{k\bullet s+v+1} & \cdot & y_{k\bullet s+v-T+3} \\ \cdot & \cdot & \cdot & \cdot \\ y_{(k+1)\bullet s} & y_{(k+1)\bullet s-1} & \cdot & y_{k\bullet s+v-T+1} \end{bmatrix}$$

where Y is a (N x T) Toeplitz matrix of received signal samples, s = N+v and is a length of a symbol including prefix, N is a symbol size expressed in samples, k is a time index, and v is a length of a cyclic prefix.

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